

**REMARKS**

The Office Action dated April 23, 2004, has been received and reviewed.

Claims 1-35 are currently pending in the above-referenced application. Claims 9, 24, and 29 have been withdrawn from consideration for being drawn to a nonelected species of invention. Each of claims 1-8, 10-23, 25-28, and 30-35, which have been considered, stand rejected.

Claims 2, 25, and 26 have been canceled without prejudice or disclaimer.

New claims 53 and 54 have been added.

Reconsideration of the above-referenced application is respectfully requested.

**Supplemental Information Disclosure Statement**

Please note that a Supplemental Information Disclosure Statement was filed in the above-referenced application on March 8, 2004, but that the undersigned attorney has not yet received any indication that the references cited in the Supplemental Information Disclosure Statement have been considered in the above-referenced application. It is respectfully requested that the references cited in the Supplemental Information Disclosure Statement of March 8, 2004, be considered and made of record in the above-referenced application and that an initialed copy of the Form PTO/SB/08A that accompanied that Supplemental Information Disclosure Statement be returned to the undersigned attorney as evidence of such consideration.

**Rejection Under 35 U.S.C. § 112, First Paragraph**

Claim 30 has been rejected under 35 U.S.C. § 112, first paragraph, for reciting subject matter which is allegedly not described in the specification of the above-referenced application in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the above-referenced application was filed, had possession of the invention recited in that claim.

Claim 30, which depends from independent claim 18, recites that the semiconductor device assembly of claim 18 includes discrete conductive elements that are positioned between bond pads of an upper semiconductor device and corresponding contact areas of a substrate.

A number of nonlimiting examples of such discrete conductive elements are provided throughout the specification and drawings of the above-referenced application. For example, Fig. 1 shows an assembly that includes discrete conductive elements 36 that extend between bond pads of a second semiconductor device 30' and contact areas 24 of a substrate 20. As another example, Fig. 1A depicts an assembly that includes discrete conductive elements 36 extending between bond pads 34' of a second semiconductor device 30' and corresponding contact areas 24'' of a substrate 20''. Figs. 8 and 9 provide additional examples of the subject matter recited in claim 30.

As the specification of the above-referenced application provides various examples of the subject matter recited in claim 30, it is respectfully submitted that one of ordinary skill in the art would readily understand that the inventor had position of the invention recited in claim 30 and, thus, that claim 30 complies with the requirements of the first paragraph of 35 U.S.C. § 112. It is, therefore, respectfully requested that the 35 U.S.C. § 112, first paragraph, rejection of claim 30 be withdrawn.

**Rejection Under 35 U.S.C. § 112, Second Paragraph**

Claim 30 also stands rejected under 35 U.S.C. § 112, second paragraph, for reciting subject matter which is purportedly indefinite.

The outstanding Office Action does not set forth any grounds for the rejection of claim 30 under the second paragraph of 35 U.S.C. § 112, second paragraph.

Nonetheless, it is respectfully submitted that, from the plain language of claims 18 and 30, one of ordinary skill in the art would be readily apprised of the scope of claim 30. Further, as noted above, the specification of the above-referenced application provides a number of examples that would be helpful to the less skilled in understanding the scope of claim 30.

It is, therefore, respectfully submitted that claim 30 is not indefinite. Thus, claim 30 complies with the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, withdrawal of the 35 U.S.C. § 112, second paragraph, rejection of claim 30 is respectfully requested.

**Rejections Under 35 U.S.C. § 102(e)**

Claims 1-8, 10, 12-23, 27, 28, and 30-35 stand rejected under 35 U.S.C. § 102(e) for being drawn to subject matter which is allegedly anticipated by the subject matter described in U.S. Patent 6,593,662 to Pu et al. (hereinafter “Pu”).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Pu describes semiconductor device assemblies in which spacers separate stacked semiconductor devices from one another. The spacers, which may be in the form of columns, are secured to the semiconductor devices by way of an adhesive material. Col. 4, lines 23-35. Pu also suggests that the spacers are rigid; they and the adhesive used therewith are configured to counteract a “cushion effect” caused by “insufficient rigidity” of an upper die as bond wires are secured to bond pads of the upper die. *See* col. 3, lines 14-18; col. 4, lines 35-39.

Independent claim 1, as amended and presented herein, is drawn to a semiconductor device assembly that includes a first semiconductor device and at least one resiliently compressible spacer protruding from a surface of the first semiconductor device.

Pu lacks any express or inherent description of a spacer that is resiliently compressible, instead explaining that insufficient rigidity is an undesirable feature of prior stacked, spaced multi-chip modules. *See* col. 3, lines 14-18; col. 4, lines 35-39. Therefore, Pu does not anticipate each and every element of amended independent claim 1.

It is, therefore, respectfully submitted that, under 35 U.S.C. § 102(e), amended independent claim 1 recites subject matter which is allowable over that described in Pu.

Claim 2 has been canceled without prejudice or disclaimer, rendering the rejection thereof moot.

Each of claims 3-8, 10, and 12-17 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 17 is additionally allowable since Pu neither expressly nor inherently describes that the spacers of the assemblies described therein may be secured to noncircuit bond pads.

Independent claim 18, as amended and presented herein, recites a semiconductor device assembly that includes first and second semiconductor devices and mutually laterally spaced discrete spacers that separate an active surface of the first semiconductor device from a back side of the second semiconductor device. At least one spacer is in communication with a ground or reference voltage plane of the first semiconductor device and, establishes communication between the ground or reference voltage plane and the back side of the second semiconductor device.

Pu neither expressly nor inherently describes an assembly that includes a spacer that is in communication with a ground or reference voltage plane of a first semiconductor device or that establishes communication between the ground or reference voltage plane of the first semiconductor device and a back side of an overlying second semiconductor device. Accordingly, Pu does not anticipate each and every element of amended independent claim 18, as would be required to maintain the 35 U.S.C. § 102(e) rejection of claim 18.

Claims 19-23, 27, 28, and 30-35 are each allowable, among other reasons, for depending either directly or indirectly from claim 18, which is allowable.

Claim 22 is further allowable because Pu does not expressly or inherently describe that the spacers of the assemblies described therein may be secured to noncircuit bond pads.

Claim 28 is also allowable since Pu lacks any express or inherent description that any of the spacers of the assemblies described therein is compressible.

Claim 29 is additionally allowable because Pu includes no express or inherent description of a semiconductor device that includes a dielectric layer on portions of a back side thereof that are to contact spacers.

Claim 32 is further allowable since Pu does not expressly or inherently describe that any of the bond wires of the assemblies described therein extends through an adhesive layer that secures the stacked semiconductor devices to one another.

For these reasons, it is respectfully requested that the 35 U.S.C. § 102(e) rejections of claims 1, 3-10, 12-23, 27, 28, and 30-35 be withdrawn.

**Rejections Under 35 U.S.C. § 103(a)**

Claims 11, 25 and 26 are rejected under 35 U.S.C. § 103(a) for being directed to subject matter that is assertedly unpatentable over the teachings of Pu, in view of the subject matter taught in U.S. Patent 6,593,662 to Ference et al. (hereinafter “Ference”).

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 11 is allowable, among other reasons, for depending from claim 1, which is allowable.

Claims 25 and 26 have been canceled without prejudice or disclaimer, rendering the rejections of these claims moot.

In any event, it is respectfully submitted that one of ordinary skill in the art would not have been motivated to combine the teachings of Pu and Ference in the manner that has been asserted.

Pu teaches assemblies that include semiconductor devices that are stacked in such a way that the active surfaces of the devices face in substantially the same direction (*i.e.*, back side-to-active surface). The semiconductor devices of Pu are spaced apart from one another by spacers that are not configured or positioned to conduct electrical signals.

The teachings of Ference, in contrast, are limited to assemblies that include semiconductor devices that are stacked and electrically connected to one another in flip-chip, or controlled-collapse chip connection (C4), configurations. Thus, the active surfaces of the semiconductor devices face one another. The solder balls that electrically connect corresponding bond pads of the semiconductor devices of Ference also space the semiconductor devices apart from one another.

It is respectfully submitted that neither Pu nor Ference, nor the knowledge that was generally available in the art before the priority date of the above-referenced application, provides one of ordinary skill in the art with any motivation to use the spacer structures of Pu in such a way as to establish communication between a ground or reference voltage plane of one semiconductor device and a back side of another semiconductor device, or to orient the semiconductor devices of Ference in any manner other than the flip-chip (*i.e.*, active surface-to-active surface) configuration taught therein.

Rather, because of the divergence between the teachings of Pu and Ference, it appears that the only source for motivation to combine the teachings of these references would have been the improper hindsight provided by the disclosure of the above-referenced application.

It is, therefore, respectfully submitted that the teachings of Pu and Ference cannot be relied upon to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a).

Therefore, withdrawal of the 35 U.S.C. § 103(a) rejection of claim 11 is respectfully requested.

#### **New Claims**

New claim 53 depends from claims 10 and 1.

New claim 54 depends from claim 18.

It is respectfully submitted that neither new claim 53 nor new claim 54 introduces new matter into the above-referenced application.

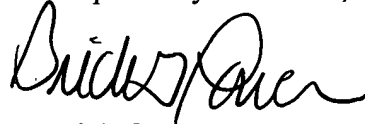
**ELECTION OF SPECIES REQUIREMENT**

It is respectfully submitted that independent claim 1 remains generic to both of the species of invention that were identified in the Election of Species Requirement in the above-referenced application. In view of the allowability of this claim, claims 9, 24, and 29, which have been withdrawn from consideration, should also be considered and allowed. M.P.E.P. § 806.04(d).

**CONCLUSION**

It is respectfully submitted that each of claims 1, 3-24, 27-35, 53, and 54 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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